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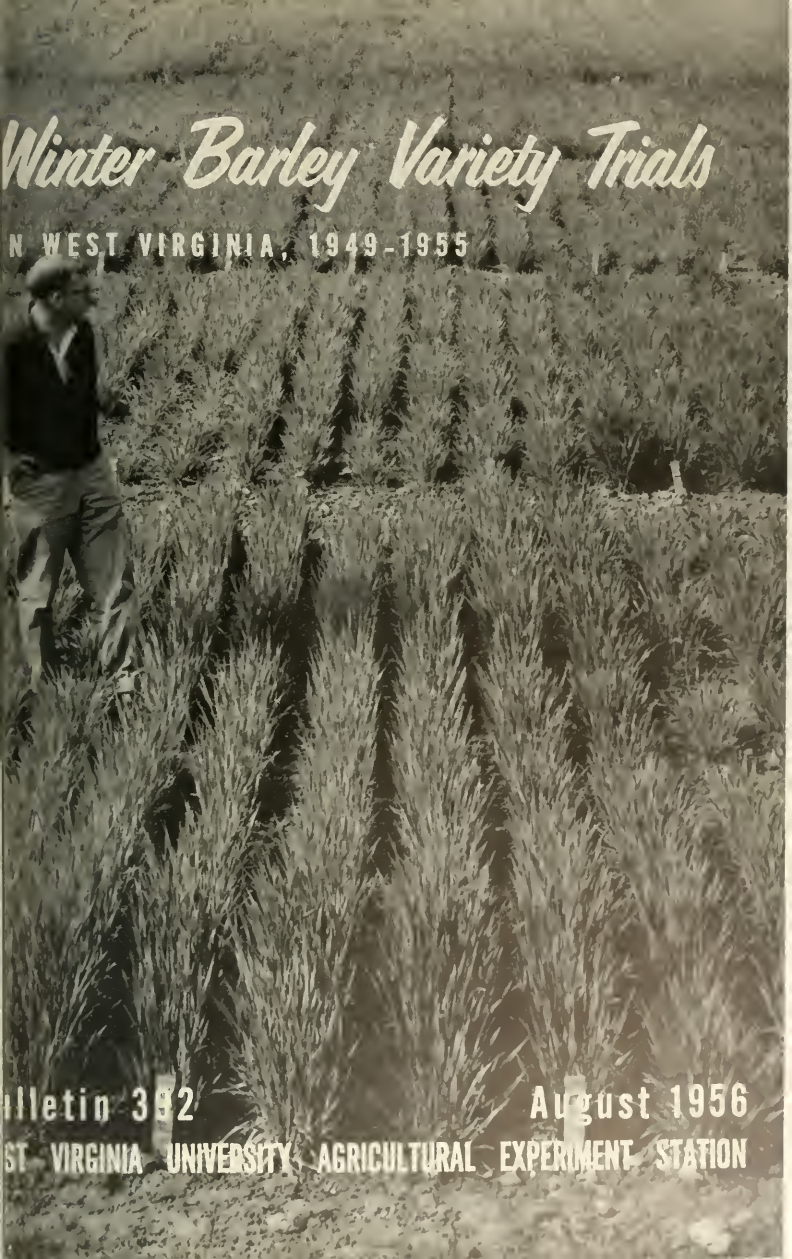
Winter barley variety trials in West Virginia, 1949-1955

Collins Veatch

Winter Barley Variety Trials

N WEST VIRGINIA, 1949-1955



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Summary

The yields of winter hardy barley varieties grown near Point Pleasant, Morgantown, Reedsville, Wardensville, and Kearneysville for the seven-year period of 1949 through 1955 are reported in the accompanying tables.

The available varieties have given good yields under favorable conditions. However, there is a need for varieties with stronger straw and more disease resistance. In several instances, variety trials have been lost as a result of lodging. This emphasizes the need for stronger straw.

On the basis of these variety trials the available varieties would be listed in the following order of preference at the indicated locations shown below:

Point Pleasant	Morgantown	Reedsville	Wardensville	Kearneysville
Kenbar	Kenbar	Kenbar	Hudson	Wong
Ohio #1	Wong	Hudson	Kenbar	Hudson
Wong	Hudson	Ohio #1	Ohio #1	Ohio #1
Hudson	Ohio #1	Wong	Wong	Kenbar

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Winter Barley Variety Trials In West Virginia, 1949 - 1955

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Introduction

THIS publication presents the results of winter barley variety trials conducted by the West Virginia University Agricultural Experiment Station for the seven years, 1949-1955, at five locations in the State.

Winter Barley in West Virginia

Winter barley is the only small grain crop that has increased in acreage and total production in West Virginia in recent years. It is a comparatively high producing feed grain. Little, if any, of this barley is used for malting.

The acreage and production of winter barley should increase with the use of hardier, stronger-strawed varieties, since the introduction of combines for harvesting has reduced the objection to rough awns.

Winter barley should normally be planted about two weeks earlier than winter wheat in order to give it a chance to become well established before cold weather retards growth. It is a good companion crop for grass and legumes seeded on the same area.

Varieties

The varieties of barley grown in West Virginia are all classified as winter hardy barley. New varieties are being developed in the never-ending attempt to keep ahead of the introduction and spread of diseases. As soon as resistance to one disease is attained, another disease or strain of disease becomes prevalent. There is also a need to improve quality as well as yield and strength of straw.

These variety trials included well-known varieties in addition to new varieties and selections. Some of the high-yielding strains grown in the U.S.D.A. Uniform Winter Hardy Barley trials were also included.

The varieties and selections reported in the accompanying tables are briefly described in Table 1. Table 2 gives a list of the other varieties and selections grown during this seven-year period. The varieties listed in Table 2 were found to be unsatisfactory in yield, strength

of straw, disease resistance, or other characteristics and were discontinued in the trials. Wong and Kentucky #2 were used as check varieties and can be used as a basis of comparison for the different years and locations.

Methods

The barley yields reported in Tables 3 through 7 are based on randomized row trials with four replications, each replication consisting of a three-row plot of each variety or selection. Sixteen feet of the center row of each eighteen-foot plot were harvested for yield after the removal of a border of one foot from each end.

These trials were conducted at the Agricultural Experiment Station farms near the following locations, on the soil types and at the elevations indicated below:

Location	Soil Type	Elevation Feet
Point Pleasant	Wheeling sandy loam	700
Morgantown	Rayne silt loam	1,200
Reedsville	Clymer loam	1,800
Kearneysville	Emory silt loam	500
Wardensville	Monongahela silt loam	950

The barley varieties or selections are grouped in the tables according to the number of years they have been included in the trials, and within this grouping in order of yield. Annual variety yields are given for all years in which the variety was grown. Average yields are shown for various numbers of years as indicated in the individual tables. The number of varieties included in each annual trial is given in each table. Some of the varieties or selections grown in the trials previous to 1955 were discontinued as mentioned in Table 2. The average yields and least significant differences (L.S.D.'s) for each year were calculated by using all of the variety yields in the trials, not just those reported in the tables.

The L.S.D.'s at the 5 per cent level are given for the annual yields and the average yields over the various periods of years as indicated.

The comparable average yields were calculated by adding the annual yields of a variety and dividing this by the sum of the average yields of all varieties for the same years. This gave the percentage rating. The average yield of all varieties for the entire period was multiplied by the percentage rating obtained for the variety; this gave the comparable average yield of the varieties, even though they may not have been included in the trials for the same number of years.

Discussion of Results

Yield is a measure of the varietal response of a plant population to environmental conditions. It is dependent upon the vigor of the plant, the ability of the plant to utilize available nutrients and to resist disease, as well as other characteristics.

When comparing yields, it should be kept in mind that unless the difference in yield between two varieties is greater than the least significant difference (L.S.D.) this difference cannot necessarily be attributed to varietal characteristics. Such differences would usually be attributed to soil or other uncontrolled variations.

Ohio Volley Experiment Station—Point Pleasant Trials

The Ohio Valley winter barley variety trials were conducted at Lakin until the Experiment Station farm was relocated near Point Pleasant in 1951, in time to seed the 1952 trials. At Lakin the barley was grown in a rotation following tobacco. The tobacco was heavily fertilized, so no fertilizer was applied to the barley. The low yields in 1950 and 1951 were attributed to dry or unfavorable weather rather than to low fertility. The 1954 trials at Point Pleasant were not harvested due to severe lodging as the result of a wind storm shortly before the barley was mature.

Three varieties, Ohio #1, Kentucky #2, and Wong, grown in the trials for six years, were among the highest producing strains. Other poorer strains were discarded. Selection 1-46-5, and Poland, have higher comparable average yields than the three varieties mentioned above, but they have been in the test only four or five years. Kenbar and Utah selection were in the trial only two years, 1953-1955, so further testing will be required to determine their relative value. However, Kenbar has been widely tested in the winter barley growing region, and is extensively recommended. Some of the selections under test, as well as the variety Hudson and the recently named Dayton gave excellent yields in 1955 and will be studied further.

Agronomy Farm—Morgantown Trials

Four varieties have been continued in the Morgantown trials for seven years due to their superior performance. They are Selection 1-46-5, Wong, Kentucky #2, and Ohio #1. Selection 1-46-5 ranks first in yield over this seven-year period with a comparable average yield of 46.85 bushels. This selection, however, is susceptible to both mildew and leaf rust, and therefore, it has not been increased. Wong and Ohio #1 are readily available varieties. Seed of Kentucky #2 is no longer

available. Kenbar and Poland have been grown for three and four years respectively with encouraging results, especially in the case of Kenbar. The Ohio selection, CH-17-36, has given higher yields at this location than the recently named Dayton. Hudson did not produce as well as some of the other varieties in 1954, but was among the best in 1955 with a yield of 57.7 bushels, as compared to 49.6 bushels for Wong and 52.1 bushels for Kenbar.

Reedsville Experiment Farm—Reedsville Trials

Winter hardiness is more essential in the Reedsville area than in any of the other locations due to the higher altitude (1,800 feet). This is reflected in the performance of Wong and other varieties that have been damaged by the winter conditions at that location.

The winter barley trial was not grown at Reedsville in 1954. The plot area was too dry and hard to plow until too late in the season for it to be feasible to plant barley.

The two lines, Kentucky #2 and Selection 1-46-5, which have been grown for six years at this location are not commercially available. The Selection 1-46-5 has given comparatively good yields, but as previously indicated, it has also shown some disease susceptibility.

Kenbar has been in the trial at Reedsville only two years, but has a comparable average yield of 39.31 bushels, as compared to 38.78 bushels per acre for Kentucky #2 over the six-year period. Hudson was the highest yielding variety in the 1955 trial at Reedsville. This is not sufficient evidence on which to base a recommendation, but Hudson has been tested over a rather wide area in the U.S.D.A. trials and has been found outstanding in many locations.

Reymann Memorial Farms—Wardensville Trials

The trials at Wardensville have been somewhat more erratic than at some of the other locations. Yields have not been as consistent or as high. The 1953 trials were not harvested as a result of excessive lodging due to storm damage at harvest time.

Only two strains, Selection 1-46-5 and Wong, have remained in these trials for the six years. Kentucky #2 was in the trials for five years and outyielded Selection 1-46-5 and Wong in four of those years. The comparable average yield for Kentucky #2 was 41.03 bushels per acre as compared to 36.10 and 33.75 for Selection 1-46-5 and Wong, respectively.

Considering the yields for the years 1954 and 1955, Hudson and Kenbar were outstanding. The comparable average yield for Hudson was 48.84 and for Kenbar 42.51 bushels per acre, which compares well

with Kentucky #2 at 41.03. Hudson was the highest yielding variety in the Wardensville trials for 1954 and 1955, with yields of 47.2 and 58.4 bushels per acre, respectively.

Kearneysville Trials

Wong, Poland, Ohio #1 and Kentucky #2 have remained in the trials at Kearneysville for the seven years, 1949-1955. Although these four varieties have varied from year to year in relative yield, Wong has the highest comparable average yield of 42.40 bushels per acre. The varieties Ohio #1 and Kentucky #2 have given acceptable yields at this location, but have usually been below Wong. The Selection 1-46-5 and 1-47-1 have consistently yielded less than Wong at this location.

Kenbar has been in the trial for three years. It gave comparatively high results in 1953, 48.1 bushels per acre, equal to the yield of Wong. Its comparable average yield was 40.60 bushels per acre as compared to 42.40 bushels for Wong.

Hudson was included in this trial in 1955 and gave the highest yield, 42.2 bushels per acre.

TABLE 1. ORIGIN AND 1955 DISEASE RESISTANCE OF WINTER HARDY BARLEY
(VARIETIES AND SELECTIONS LISTED IN TABLES 3-7)

VARIETY	C.I. NO.	STATE OF ORIGIN	PARENTAGE OR ORIGIN	DISEASE ON 1955 MORGANTOWN TRIAL AS REPORTED BY DR. E. S. ELLIOTT			
				POWDERY MILDEW*	LEAF RUST*	SCALD	STRIPE
Dayton	9517	Ohio	Selection from Composite Cross x C.I. 6625	2.50	2.50	x	
Hudson	8067	N.Y.	Michigan Winter x Wong	1.00	2.50		
Kenbar	7574	Kentucky	Selection from Composite Cross x C.I. 6625	1.00	3.00	x	x
Kentucky No. 2	6148	Kentucky	Selection from Tenn. Winter Type	3.00	1.80		
Lignee No. 125	7284	Introd.	Introduction from Belgium	2.50	2.00		
Ohio No. 1	7072	Ohio	Selection from locally grown barley	2.75	2.75		
Ohio CH-47-36	9518	Ohio	Selection from Composite Cross x C.I. 6625	1.50	1.25		
Poland	6280	N.Y.	Introduction from Poland	2.25	1.50		x
Selection 1-46-5	.....	W. Va.	Selection from Composite Cross x C.I. 6625	3.00	2.00		
Selection 1-47-1	.....	W. Va.	Selection from Composite Cross x C.I. 6625	1.50	3.75		
Utah B120-30-2	7569	Utah	(Coast x Lion) x Winter Club	2.50	2.00		
Woog	6728	N.Y.	Orel x unnamed Chinese variety	0.75	3.00	x	
W.B.-28	.....	W. Va.	Wong x Kentucky No. 1	1.25	3.25	x	
W.B.-35	.....	W. Va.	Wong x Kentucky No. 1	0.75	3.00	x	
W.B.-36	.....	W. Va.	Wong x Kentucky No. 1	2.00	4.00	x	

*—0—no infection observed.
4—heavy infection.
x—infection present.

Table 2. Winter Barley Varieties and Selections Which Were Tested and Discarded

Varieties

Argando	Missouri 705
Brier	Nassau
Calhoun	Nebraska 412487
Davidson	Purdue 1101
Kentucky #1	Reno
Ludwig	Scottish Pearl
Missouri Early Beardless	Suwon #4
Missouri B-400	Tennessee Winter #52
Missouri 580	Tucker
Missouri 637	Union
Missouri 640	Ward
Missouri 699	Woods Beardless

W. Va. Selections

1-45-2	1-46-6
1-45-3	1-47-2
1-45-20	WB-15
1-45-22	WB-27
1-45-27	WB-28
1-45-29	WB-30
1-45-34	WB-31
1-46-1	WB-32
1-46-2	WB-33
1-46-3	WB-54
1-46-4	

TABLE 3. AVERAGE AND ANNUAL YIELDS OF WINTER BARLEY AT POINT PLEASANT—1949-1955

VARIETY	C.I. No.	AVERAGE YIELDS (BU. A.)			COMPARABLE* AV. YIELD	YIELD IN BUSHELS PER ACRE					
		2-YR. AV.	4-YR. AV.	6-YR. AV.		1949	1950	1951	1952	1953	1955
Ohio No. 1	7072	43.45	37.88	38.08	36.65	54.1	22.9	23.6	41.0	30.8	56.1
Kentucky No. 2	6148	49.00	39.83	37.53	36.13	46.4	19.5	24.1	37.2	36.5	61.5
Wong	6728	48.30	37.38	36.03	34.68	46.4	20.3	20.1	32.8	45.6	51.0
Sel. 1-46-5		48.70	41.40		38.39		22.9	25.3	42.9	41.6	55.8
Sel. 1-47-1		42.10	30.63		28.21			16.8	21.5	38.3	45.9
Poland	6280	51.25			38.95		21.7		41.9	44.5	58.0
Kenbar	7574	53.55			40.23					38.0	69.1
Utah B120-30-2	7569	52.65			39.55					41.6	63.7
WB-36											63.5
Dayton	9517										61.2
Lignee No. 125	7284										59.0
WB-35											56.7
Hudson	8067										53.5
Ohio CH-47-36	9518										53.2
Number of varieties in trial						14	25	25	23	14	23
Average						46.64	20.0	22.7	36.43	38.88	54.86
L.S.D. .05		8.50	4.14	3.67		10.26	8.39	16.95	5.40	10.97	12.22

*The *comparable average yield* was calculated by adding the annual yields of a variety and dividing this by the sum of the average yields of all varieties for the same years. This gave the percentage rating. The average yield of all varieties for the entire period was multiplied by the percentage rating obtained for the variety; this gave the comparable average yield of the variety.

TABLE 4. AVERAGE AND ANNUAL YIELDS OF WINTER BARLEY AT MORGANTOWN—1949-1955

VARIETY	C.I. No.	AVERAGE YIELDS (BU./A.)				COMPARABLE* AV. YIELD	YIELD IN BUSHELS PER ACRE						
		2-YR. AV.	3-YR. AV.	6-YR. AV.	7-YR. AV.		1949	1950	1951	1952	1953	1954	1955
Sel. 1-46-5	.....	49.20	48.17	45.83	46.99	46.85	53.9	46.8	47.3	36.4	46.1	48.9	49.5
Wong	6728	53.60	50.83	47.78	46.69	46.54	40.1	57.3	58.6	18.3	45.3	57.6	49.6
Kentucky No. 2	6148	49.15	47.23	46.38	46.53	46.39	47.4	51.6	48.7	36.3	43.4	48.1	50.2
Ohio No. 1	7072	44.90	43.10	43.42	43.24	43.12	42.2	46.1	45.1	40.0	39.5	33.9	55.9
Sel. 1-47-1	.....	45.15	45.00	40.83		40.65		47.7	48.9	13.4	44.7	50.6	39.7
Poland	6280	51.05	47.07			46.12				36.1	39.1	46.7	55.4
Kenbar	7574	55.35	48.13			47.06					33.7	58.6	52.1
Utah B120-30-2	7569	40.95	40.30			39.40					39.0	40.9	41.0
Lignee No. 125	7284	42.50	40.03			39.14					35.1	43.1	41.9
Ohio C11-47-36	9518	62.85				56.52						66.5	59.2
Dayton	9517	58.60				52.70						59.6	57.6
Hudson	8067	52.95				47.62						48.2	57.7
WB-35	.....												50.9
WB-36	.....										19.1		52.1
Number of varieties in trial							21	28	23	21	30	20	25
Average							42.87	44.59	49.60	33.47	36.45	47.09	48.87
L.S.D. .05		10.74	8.13	5.94	4.84		7.01	19.57	10.22	16.78	10.89	17.05	11.80

*See footnote Table 3.

TABLE 5. AVERAGE AND ANNUAL YIELDS OF WINTER BARLEY AT REEDSVILLE—1949-1955

VARIETY	C.I. NO.	AVERAGE YIELDS (BU. A.)				COMPARABLE* AV. YIELD	YIELD IN BUSHELS PER ACRE					
		2-YR. AV.	3-YR. AV.	5-YR. AV.	6-YR. AV.		1949	1950	1951	1952	1953	1955
Kentucky No. 2	6148	40.85	38.73	39.52	38.43	38.78	33.0	54.0	27.4	34.5	35.2	46.5
Sel. 1-46-5		42.20	41.83	39.42	38.07	38.41	31.3	48.2	23.4	41.1	37.1	47.3
Ohio No. 1	7072	31.60	31.10	34.98		34.06		47.9	33.7	30.1	29.6	33.6
Wong	6728	33.20	32.13	31.44		30.61		38.8	22.0	30.0	35.0	31.4
Sel. 1-47-1		42.00	42.13			35.33		26.1		43.3	45.5	38.5
Poland	6280	39.45	37.67			35.08	23.0			34.1	37.3	41.6
Kenbar	7574	41.95				39.31					37.2	46.7
Utah B120-30-2	7569	34.10				31.95					31.4	36.8
Hudson	8067											50.4
Ohio CH-47-36	9518											48.1
WB-36												41.0
Lignee No. 125	7284											37.4
WB-35												36.1
Dayton	9517											29.2
Number of varieties in trial							16	24	25	22	14	23
Average							28.8	45.3	28.1	33.04	35.54	40.16
L.S.D. .05		10.9	6.26	4.46	N.S.		7.00	16.85	8.17	11.45	12.10	11.50

*See footnote Table 3.

TABLE 6. AVERAGE AND ANNUAL YIELDS OF WINTER BARLEY AT WARDENSVILLE—1949-1955

VARIETY	C.I. No.	AVERAGE YIELDS (BU./A.)			COMPARABLE* AV. YIELD	YIELD IN BUSHELS PER ACRE					
		2-YR. AV.	3-YR. AV.	6-YR. AV.		1949	1950	1951	1952	1954	1955
Sel. 1-46-5	.....	44.95	37.27	35.9	36.10	28.4	39.4	35.7	21.9	41.1	48.8
Wong	6728	40.85	33.73	33.5	33.75	28.9	26.9	41.3	19.5	42.6	39.1
Kentucky No. 2	6148	39.75	35.50		41.03	38.6	49.5		27.0	29.9	49.6
Poland	6280	40.35	35.07		37.50		39.2		24.5	27.4	53.3
Sel. 1-47-1	.....	31.40	28.63		33.78			50.1	23.1	23.0	39.8
Hudson	8067	52.80			48.84					47.2	58.4
Kenbar	7574	45.95			42.51					40.2	51.7
Lignee No. 125	7284	43.05			40.38					30.8	56.5
WB-28	.....	42.20			39.04					34.5	49.9
Utah B120-30-2	7569	41.45			38.34					32.9	50.0
Dayton	9517	39.45			36.49					33.3	45.6
Ohio No. 1	7072	37.85			35.85					25.5	50.2
Ohio CH-47-36	9518	37.20			34.41					18.1	56.3
WB-35	.....										41.6
WB-36	.....										35.8
Number of varieties in trial						17	25	25	23	20	25
Average						33.19	38.6	45.25	23.81	32.34	47.74
L.S.D. .05		10.18	6.98	N.S.		7.19	9.82	7.97	7.97	11.04	15.41

*See footnote Table 3.

TABLE 7. AVERAGE AND ANNUAL YIELDS OF WINTER BARLEY AT KEARNEYSVILLE—1949-1955

VARIETY	C.I. No.	AVERAGE YIELDS (BU./A.)			COMPARABLE* AV. YIELD	YIELD IN BUSHELS PER ACRE					
		2-YR. AV.	4-YR. AV.	6-YR. AV.		1949	1950	1951	1952	1953	1954*
Wong	6728	39.70	40.23	43.43	42.40	45.1	54.6	54.0	27.5	48.1	31.3
Poland	6280	42.05	40.70	43.10	42.08	53.0	42.8	44.5	34.2	47.8	36.3
Kentucky No. 2	6148	35.05	38.33	42.55	41.54	50.1	51.9	50.0	33.2	41.3	28.8
Ohio No. 1	7072	39.50	38.68	41.68	40.69	53.4	42.0	40.1	35.6	41.4	37.6
Sel. 1-46-5	.....	39.75	38.60		39.42			49.5	25.4	43.4	36.1
Sel. 1-47-1	.....	33.35	33.55		34.27			45.1	22.4	40.2	26.5
Kenbar	7574	38.75			40.60					48.1	29.4
Utah B120-30-2	7569	36.65			38.40					42.3	31.0
Hudson	8067										42.2
Lignee No. 125	7284										36.2
WB-28	.....										35.2
Ohio CH-47-36	9518										32.7
Dayton	9517										29.6
WB-30	.....										26.4
WB-35	.....										26.2
Number of varieties in trial						14	25	25	23	14	25
Average						48.94	37.10	47.50	29.97	42.61	31.05
L.S.D. .05		7.04	4.63	3.83		9.29	13.85	17.03	7.64	8.18	11.80

*See footnote Table 3.